PROFILE 2016

American Iron and Steel Institute

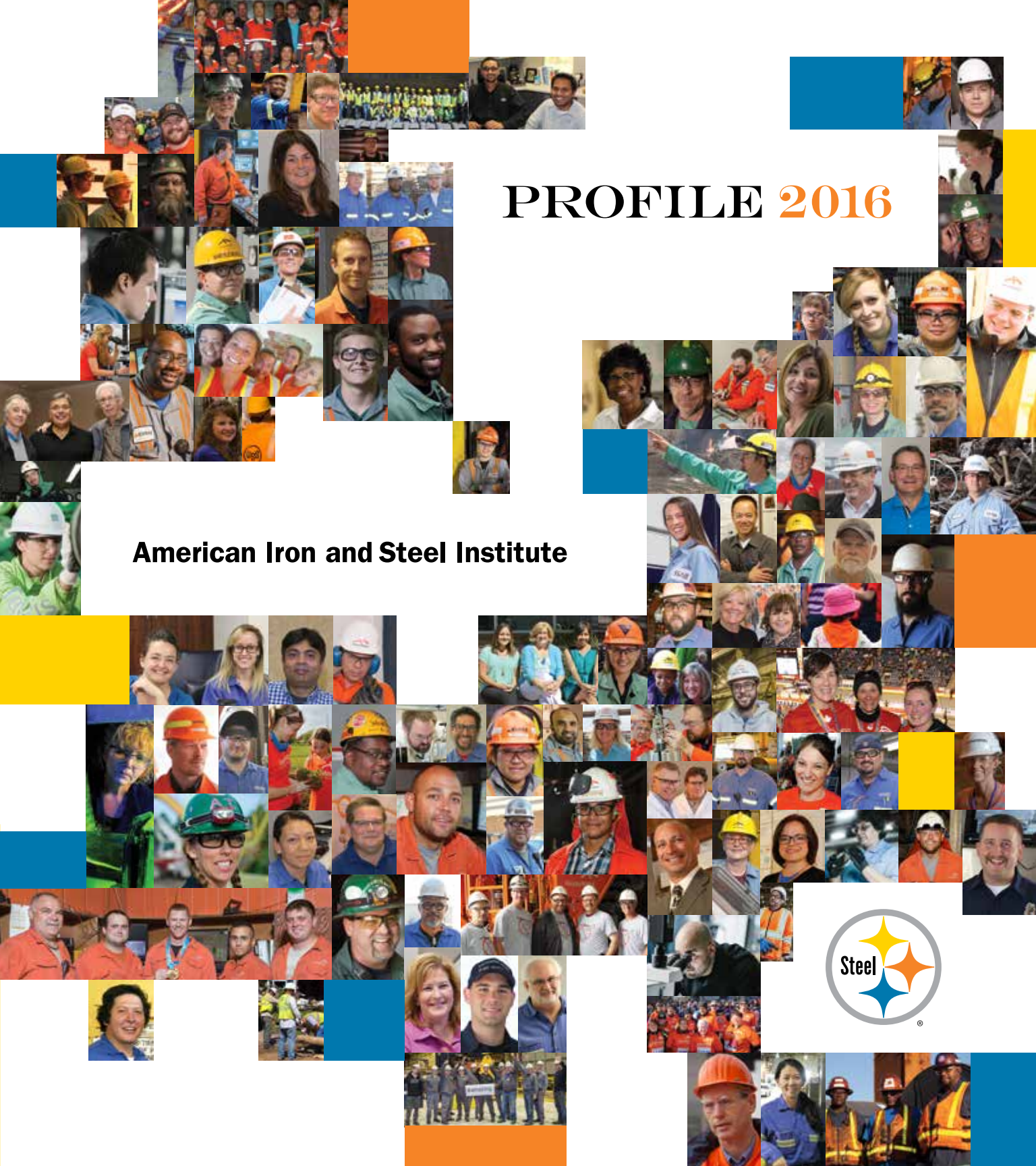

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Photo courtesy of EVRAZ North America

A Message from AISI President and CEO Thomas J. Gibson

We are dedicating this issue of the Profile of the American Iron and Steel Institute to the employees of the North American steel industry. The faces of the steel industry are people you and I know. They work in communities all across America and they are dedicated to excellence and safety.

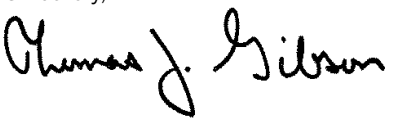
We enjoy the benefits of steel in all aspects of our lives. From the moment we wake up until we go to sleep at night, we rely on steel in almost every aspect of our day. In the kitchen, our refrigerator is made of steel—and so many other appliances have steel components. On our way to the office, a job site or to school, we rely on the safety of steel to reinforce our roads, define our bridges and form the body of our cars and trucks. As we glance out our windows we may notice that signs, guardrails, railroad tracks, construction cranes, pipes, commercial buildings and telephone utility poles are all made of steel. And even though we may not notice, the computers we use 24-7 have steel in them.

Our nation has prospered from having a strong manufacturing based economy. Every job in the American steel industry supports nearly seven jobs in the U.S. economy. And the steel industry directly or indirectly supports almost one million American jobs.

This 2016 Profile highlights the accomplishments of the North American steel industry and its important role in our society. It shows why our industry has achieved remarkable progress in sustainability and it documents our innovations in revolutionary new steelmaking technologies. However, we cannot allow our successes in innovation, productivity, quality, performance and sustainability to be undercut by a surge of unfairly traded imports. I urge you to visit our website, **www.steel.org** and click on "Make Your Voice Heard" to join us in our fight against trade-distorting practices that are harming the steel industry and our economy.

Many key markets and customer sectors rely on the success of the steel industry: automotive, construction, container, transportation and infrastructure, energy and national security—among others. We must continue to work together to ensure that making steel in America remains a fundamental pillar of our economy.

Sincerely,



THOMAS J. GIBSON
President and CEO, American Iron and Steel Institute (AISI)

Photo credits: Top R – Alan Copson/Getty Images; Bottom R – Lightvision, LLC/Getty Images

American Steel—Strength for our Future

The American steel industry continues to be a cornerstone of the American economy.

The backbone of manufacturing, steel is a strategic industry essential to America's economic growth and stability. The steel sector helped build the face of America, engendering a sense of national pride through famous landmarks such as the Golden Gate Bridge welcoming visitors to our Pacific Coast, the St. Louis Gateway Arch at the crossroads of America, the Chrysler Building that gives a unique flourish to New York City's skyline and the new One World Trade Center, now the tallest building in America.

Not only is it an essential material in these American treasures, steel is fundamental to American society and our modern way of life. Our nation's energy supply, transportation system, urban centers, clean water and safe food supply all depend on steel. Innovation and technology have transformed America's 21st century steel industry into a world leader in quality, performance and sustainability.

New York City skyline with One World Trade Center; Gateway Arch

Steel is the material that augments the well-being of people and the planet.

Steel: Building a Sustainable Future

Steel is vital to a modern, sustainable society. The same steel that enables manufacturers to make lighter, more fuel-efficient vehicles, and taller, safer structures is also the most recycled material in the world. While competing materials focus their sustainability claims on specific phases of product application, steel's superior sustainability performance minimizes environmental impact when measured through the entire life cycle.

Steel's contributions to helping achieve the triple bottom line of environmental, economic and societal sustainability make it vital to achieving the needs of today without impacting society's ability to meet the needs of the future. For example:

Steel's high recycling rate is fundamental to energy and emissions savings and resource conservation.

Photo courtesy of Nucor Corporation

- The steel industry is fundamental to the manufacturing sector and to the overall North American economy—directly and indirectly supporting almost one million U.S. jobs.
- The steel industry is critical to daily life, domestic infrastructure and national security; providing for more fuel-efficient, safe cars; innovating infrastructure with lighter utility poles and bridges, lowering energy consumption and costs with steel roofing, and giving access to nutrition in times of emergency and financial need.
- Steel advances the quality of life North Americans enjoy through innovation and proven performance through five-star safety rated auto bodies; durable framing for buildings that holds up in high winds, earthquakes and fire, and eliminating food waste with pre-measured packaging with a long, stable shelf-life.
- Codes and standards for steel construction enable designers and builders to utilize more cost-effective and efficient practices, which ultimately improves stakeholders' bottom line.
- The steel industry is actively dedicated to meeting society's needs and advancing environmental stewardship, achieving a 31 percent reduction in energy intensity and a 36 percent reduction in greenhouse gas intensity since 1990.
- When looking at the energy intensive production processes of competing materials in the auto sector, vehicles using high-strength steels provide significant reduction in emissions.

Photo courtesy of Nucor Corporation

Recycling

The overall recycling rate of steel is 86 percent based on the most recent data compiled by the Steel Recycling Institute (SRI) through 2014. Steelmaking furnaces consumed nearly 70 million tons of domestic steel scrap in 2014. All steel is 100 percent recyclable and more steel is recycled each year than aluminum, copper, paper, glass and plastic combined.

Steel is the engine that drives the recycling of many consumer goods, as evidenced by the high recycling rates of: automobiles (95 percent), appliances (88 percent), steel containers (70 percent), structural steel (98 percent) and construction reinforcement steel (71 percent). Recycling rates for autos are often near or more than 100 percent as older vehicles being recycled are often heavier than new cars, which are lighter and more fuel-efficient through the use of advanced high-strength steels.

As a result of the steel industry's commitment to sustainability, we are aggressively seeking ways to reduce our environmental footprint while producing the advanced and highly recyclable steel that our economy needs. A helpful tool the industry is using as part of this process is the Life Cycle Analysis (LCA) approach, which is essential to measuring the real environmental impact of a material. Among other things, LCA considers the total environmental impacts generated by the production, as well as use and end-of-life (recycling or disposal) phases of a product. Steel has life cycle advantages over competing materials because of its relatively low energy use, high recyclability, conservation of natural resources and the extensive re-use of by-products.

Global Leader in Labor Productivity

The steel industry directly employs about 142,000 people in the United States, and directly or indirectly supports almost one million U.S. jobs. Labor productivity has seen a five-fold increase since the early 1980s, going from an average of 10.1 man-hours per finished ton to an average of 1.9 man-hours per finished ton of steel in 2015. Many North American plants are producing a ton of finished steel in less than one man-hour. These achievements are only possible through a highly skilled workforce. Member companies of the American Iron and Steel Institute (AISI) are committed to continuous improvement in safety and health and to achieving an injury-free workplace.

Despite such strong performance by the steel industry and its workforce, American steelmakers' ability to compete globally is being threatened by nations unwilling to abide by American trade laws and international trade rules set by the World Trade Organization (WTO). Many of these steel industries are owned and/or subsidized by foreign governments. Nations that habitually circumvent and evade U.S. antidumping and countervailing duty laws to send unfairly traded imports into our market must face consequences. To counter such foreign unfair trade practices, the United States must establish and enforce trade policies that will truly level the international playing field for all manufacturers.

China's currency, which many experts believe to be undervalued, is an example of a trade-distorting practice that harms the U.S. economy by keeping the prices of exported Chinese goods artificially low compared to similar goods from the United States and our trading partners.

The U.S. steel industry is in the top tier of labor productivity worldwide at an average of 1.9 man-hours per ton of steel produced, with many facilities producing a ton of steel in less than one man-hour.

Photo courtesy of TimkenSteel Corporation

While the American steel industry is highly competitive, utilizing state-of-the art equipment and investing in new technologies, in 2014 and into 2015 the industry experienced a significant financial downturn and was completely decoupled from the modest growth occurring in the rest of the economy. This was a result of the continuing surge in dumped and subsidized imports coming into the U.S. market from around the world. Steel imports increased by 36 percent in 2014 and captured a record 28 percent of our steel market. The situation worsened in 2015 with finished steel imports capturing 29 percent of the U.S. steel market, an all-time record.

A major cause of the steel import surge was global steel industry overcapacity, especially in China. The Organization for Economic Cooperation and Development (OECD) estimates that there is almost 700 million metric tons of excess steel capacity globally today, with almost half of that coming from China.

Photo courtesy of ArcelorMittal

Our people are our most important asset. AISI works with its member companies to attract and retain a highly skilled workforce, and to support the development and maintenance of healthy, safe and environmentally sound operations and products.

- China has claimed that it should be graduated to market economy status in December 2016. AISI disagrees. If China is graduated to market economy status before it is truly a market economy, the antidumping law will no longer provide effective relief against Chinese imports. Given the significant role of the Chinese government in many key aspects of its economy, and especially in its state-owned and controlled steel sector, there can be no question that China remains a non-market economy.

- Three NAFTA economists just completed a report finding that granting China market economy status in antidumping cases would have very negative results, leading to losses of 400,000 to 600,000 jobs in the United States and near-term losses in Canada of up to 60,000 highly-skilled, well-paying jobs.

American manufacturers, including U.S. steelmakers, can compete with anyone in the world, but we cannot compete with governments. That is why AISI consistently urges our government leaders to enact policies that promote and restore manufacturing in our country and create millions of new jobs by investing in infrastructure, promoting a tax structure that encourages investment, addressing excessive regulatory burdens, achieving domestic energy self-sufficiency and strongly enforcing our trade laws.

The North American steel industry consists of healthy, world-class companies that are internationally competitive.

Photo courtesy of Tenaris

Steel's Presence Throughout America

Steel has long been considered the backbone of the American manufacturing sector, providing an essential material for downstream manufacturers in the automotive, energy, machinery and equipment, container, appliance and rail industries. Steel is a critical building material for the nation's energy, transportation and water infrastructure and for commercial and residential construction. In addition, steel products are a critical component in virtually every military platform and are essential to our national defense.

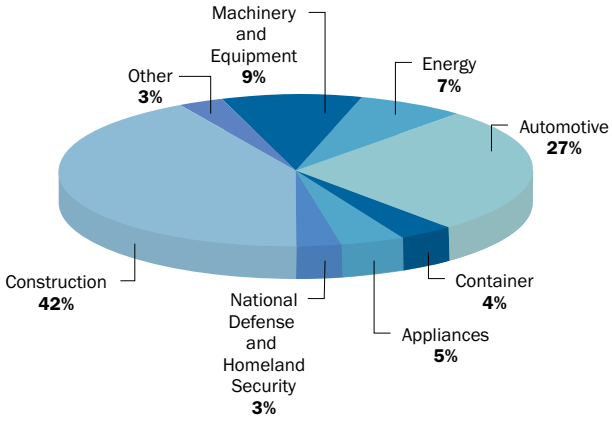
In the second decade of the 21st century, the steel sector is recovering from the worst global recession since World War II. Prior to the recession, the steel industry enjoyed five consecutive years of robust demand and strong performance. The North American steel industry consists of healthy, world-class companies that are internationally competitive. In 2015, the steel industry experienced high levels of imports that continued to negatively impact steel production. The following is a summary of selected 2015 statistics for the American steel sector:

2015 U.S. Steel Industry
STATISTICAL HIGHLIGHTS

Steel shipments	87 million tons
Imports (finished)	31 million tons
Exports	10 million tons
Apparent steel demand	108 million tons
Direct employment	141,900*

Source: American Iron and Steel Institute
*Based on U.S. Department of Labor 2015 December monthly employment data

2015 Steel Shipments* by Market Classification



Source: American Iron and Steel Institute
*Estimated percentages

AISI members lead the world in making steel products efficiently.

Photo courtesy of California Steel Industries, Inc.

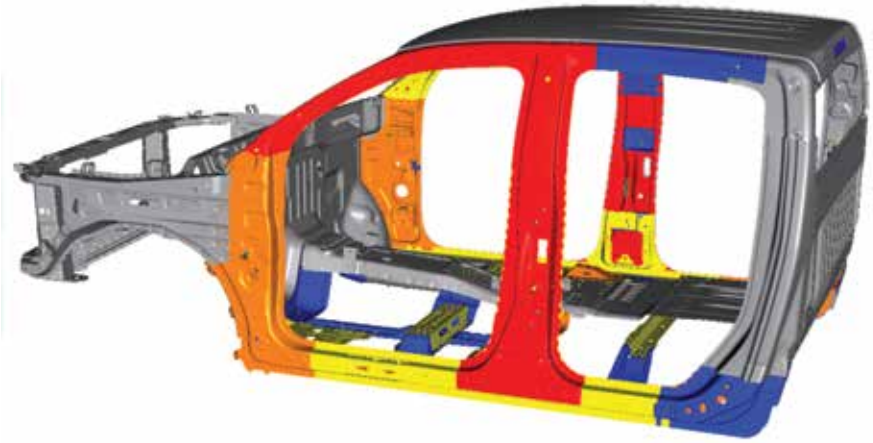
Energy

Energy is of critical importance to the North American steel industry, as the production of steel is inherently energy intensive. The industry consumes substantial amounts of electricity, natural gas and coal and coke to make our products, and energy is generally 20 percent or more of the cost of producing a ton of steel.

The U.S. steel industry continues to make efforts to increase energy efficiency and is leading the way by effectively setting the bar for steel industry efficiency worldwide. Our industry has made substantial gains in reducing energy usage, as well as our environmental footprint, over the last two decades. The domestic steel industry has voluntarily reduced its energy intensity by 31 percent since 1990 and the U.S. Department of Energy recently indicated that the industry in the United States has the lowest energy intensity of any major steel producing nation. The availability and reliability of supplies of these types of energy are essential to our industry's international competitiveness, especially as steelmakers in competitor nations often receive subsidized energy.

The products made by the steel industry are also essential to the energy sector. Whether it is oil country tubular goods (OCTG) and line pipe for oil and gas production and transportation, key materials for electricity generation and transmission or critical components for wind and solar energy, steel makes all forms of energy possible.

One particular key development in the last few years is the discovery and increased production of oil and natural gas from domestic shale formations. Affordable natural gas is presenting all steelmakers with new options for how to make their products more efficiently and provides expanded markets for steel pipe and tube products that are essential to the production and transmission of natural gas and oil. The production of shale-based oil and natural gas is leading to a manufacturing renaissance in the United States through significant investments, plant expansions and job creation.



- Press Hardened Steel
- Multi-Phase and Martensite
- Dual-Phase
- HSLA
- Bake Hard and Mild Steel

Image courtesy of Great Designs in Steel 2015

The 2015 Chevrolet Colorado features 72 percent high- or advanced high-strength steels in its main cab structure. The AHSS contributed to decreased mass, reduced noise and vibration and improved stiffness — contributing to a durable and quiet ride.

Automotive

The North American automotive market produced more than 17 million vehicles in 2015, with forecasts calling for continued growth. Aggressive regulations enacted in 2012 require fuel economy to double by 2025 to 54.5 miles per gallon (mpg), creating intense materials competition as automakers look to make vehicles lighter to meet the new regulations.

Advanced high-strength steels (AHSS) provide the properties automakers need to achieve their future fuel economy targets and are being rapidly adopted while our industry accelerates the development of new grades with even higher strength and formability. The Steel Market Development Institute (SMDI), a business unit of AISI, leads aggressive projects with our customers' engineers on optimal use of these materials so the best lightweight designs are incorporated in new vehicles as quickly as possible.

AHSS, combined with innovative auto manufacturing methods, like tailor rolling and tailor welding, enables steel to achieve weight reduction levels virtually equivalent to those of alternative materials, and at a higher value than alternative materials. One example is front lower control arm, a suspension part which was redesigned by the Auto/Steel Partnership and Multi-matic Inc. using AHSS at the same weight and one-third less cost than the incumbent aluminum version.

Many similar projects with our customers dominate SMDI's automotive portfolio. Our highest priority goal remains to defeat alternative materials by proving customers' weight reduction goals can be met with steel, and at a high value.

Automotive Communications Program

The truck and SUV segment of the automotive market is where materials competition is most intense as higher levels of weight reduction are needed to meet new fuel economy targets by 2025. Early in 2014, SMDI launched an enhanced automotive communications program highlighting the strength, durability, sustainability and mass reduction advanced with steel. The program is aimed at materials decision makers and influencers, as well as national and trade media, and includes a focused public relations effort, regional advertising, customer marketing activities and social media outreach.

Since the program's launch, the strategies have helped maintain steel's position as the automotive material of choice while helping to strengthen SMDI's relations with the automotive industry, media and consumers nationally and within SMDI's target markets. "Steel Matters: Demand Nothing Less" reminds audiences of the role AHSS plays in the automotive industry's efforts to meet federally mandated fuel economy, and emissions and safety standards in the coming years. The program's main objective continues to be positioning AHSS as the highest value material and the benchmark customers and consumers should use to measure other lightweighting choices.

SMDI has established a robust presence at key events drawing in customer and consumer audiences through advertising, media relations, speaking opportunities and social media. For the 2016 fiscal year, SMDI will continue to include presence at and sponsorship of various auto shows and media-focused events across these regions with a strong focus on life cycle assessment and sustainability. SMDI continues to build its relationships with automotive company leaders to share information about the role of AHSS as the material of choice for existing and future vehicles.

The 2016 Honda Pilot cutaway, featured in SMDI's exhibit at the 2016 North American International Auto Show, features a body structure composed of 21.3 percent ultra-high-strength steel for added strength and enhanced rigidity, as well as improved collision safety performance.

Photo courtesy of Steel Market Development Institute

Photo courtesy of devrouax & purnell architects and Populous

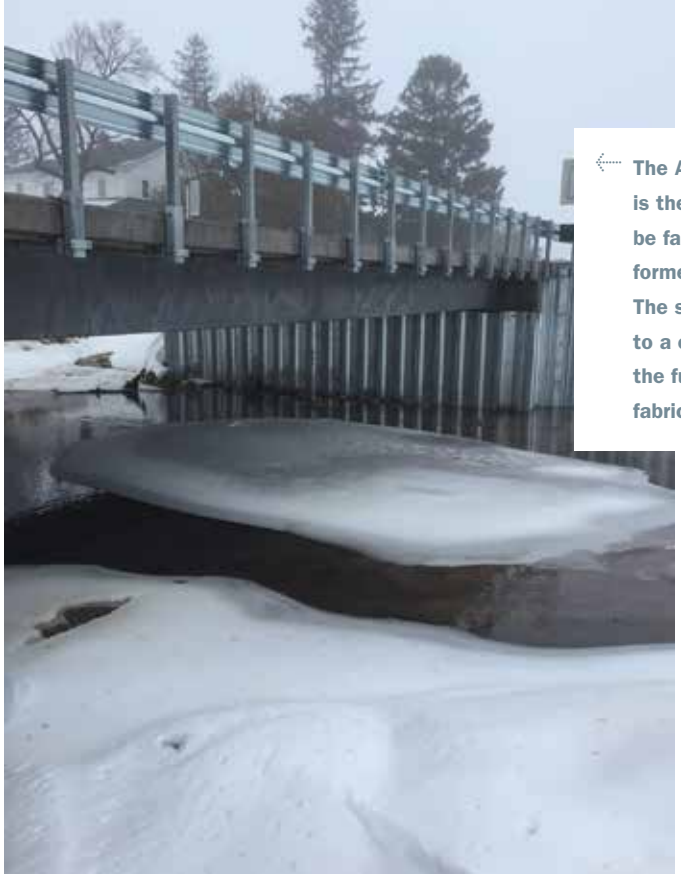
Nationals Park in Washington, D.C., is the first Major League Baseball stadium to earn LEED certification and contains 7,800 tons of steel.

Construction

The National Institute of Standards and Technology notes that "steel has become one of the most reliable, most used and most important materials of the age." As an advanced engineered material, steel is the material of choice by engineers and architects because of its strong performance characteristics, reliability, versatility in design, consistency as a product and "green" profile.

Residential and Commercial Construction

AISI-generated building standards have been incorporated into the most recent editions of the International Building Code (IBC) and the International Residential Code (IRC) and are used throughout the world. Steel continues to provide a proven environmentally responsible solution for meeting green building requirements in sustainability standards such as the International Green Construction Code (IgCC), ASHRAE 189.1, the National Green Building Standard (ICC-700) and green building rating systems like the U.S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED).



The Amish Sawmill Bridge in Buchanan County, Iowa is the first short span bridge in the United States to be fabricated and installed with a steel press brake-formed tub girder. It was dedicated on January 8, 2016. The steel industry developed this design in response to a challenge from the FHWA. This project represents the future of short span steel bridge construction and fabrication.

Bridges

Bridges connect us as a nation. We need them to transport billions of tons of freight each year from coast-to-coast.

Yet the Federal Highway Administration (FHWA) estimates that nearly 24 percent of America's more than 600,000 bridges are either structurally deficient or functionally obsolete. The American Society of Civil Engineers (ASCE) *2013 Report Card for America's Infrastructure* graded the nation's bridges with a "C+" and noted an annual investment need of $20.5 billion to eliminate the deficient bridge backlog by 2028, while only $12.8 billion is currently spent.

Repairing and/or replacing these bridges with modern steel bridge designs must be a national priority. Steel bridges offer owners practical design and accelerated bridge construction solutions that are durable, cost-effective and offer ease of maintenance and construction. A free, web-based design tool developed by the Steel Market Development Institute and other partners of the Short Span Steel Bridge Alliance—eSPAN140—allows users to download customized preliminary steel bridge designs in three easy steps and in less than five minutes, saving them significant time and costs. More than 2,000 eSPAN140 preliminary designs have been generated since 2012.

America's bridges are utilizing bridge technologies that help save taxpayer dollars as we rebuild our infrastructure over the next two decades. Designers and engineers can specify new high-performance steels (HPS) developed by member companies of AISI with the Office of Naval Research and FHWA. These steels have superior toughness and can be welded with little or no preheat. Today, there are more than 500 HPS bridges in use in 47 states.

Photo courtesy of SSAB Americas

Every $1 billion invested in highways supports 27,823 jobs, according to the Federal Highway Administration.

Transportation/Infrastructure

In a globalized economy, America's infrastructure is important to our competitive edge. A globally competitive economy depends on an effective and efficient transportation infrastructure. The American Road and Transportation Builders Association reports that the U.S. transportation construction industry generates more than $500 billion in total annual economic activity for the nation and sustains nearly 4 million jobs—the equivalent of 1.6 percent of the nation's gross domestic product (GDP). AISI supports strong public policy initiatives that equip the manufacturing sector to remain competitive and provide sustainable, long-term financing mechanisms for federal transportation infrastructure investments.

Electric Utility Distribution Poles

Steel's profile as a green material has led to growing interest in replacing aging wood electric utility distribution poles with poles made of steel. A detailed life cycle assessment study published in 2013 finds that replacing wood utility poles with galvanized steel utility poles results in several significant environmental benefits, including lower levels of greenhouse gas and aerosol emissions associated with global climate change; a lower burden on critical energy resources; reduced impacts on the habitats of many threatened and endangered species; and reduced impacts associated with hazardous emissions and wastes. These findings provide data that contradict the traditional wood industry claims of being a superior sustainable material.

Steel utility distribution poles have a number of clear advantages over competing materials (treated wood and concrete). These include ease of installation, reliability, durability, life cycle cost and environmental considerations. There are approximately 185 million utility distribution poles in North America, and an estimated 4–5 million wood poles are replaced annually.

Since 1998, close to one million steel distribution poles have been installed and are now being used by approximately 600 of 3,100 U.S. electric utilities.

The nearly 20 billion steel cans recycled last year would line a path to the moon and back seven times.

Packaging

Steel cans are the most recycled food package in the world, giving steel an important role in providing sustainable packaging for foods that carry important nutrients essential to a healthy diet. According to a study published in the *Journal of the Academy of Nutrition and Dietetics*, children and adults who eat canned fruits and vegetables have greater overall fruit and vegetable consumption, better diet quality and increased nutrient intake compared to children and adults who do not eat canned fruits and vegetables.[1]

Photo credit: istock.com/studio-Annika

The Canned Food Alliance informs consumers, health professionals and government officials about the benefits of canned food, including nutritional value, convenience, affordability, versatility and year-round availability.

Additional research shows that canned foods provide needed nutrients often at a lower cost than fresh, frozen and dried forms, particularly when price, waste and time to prepare are considered.[2] The Canned Food Alliance (CFA) comprised of steel and can manufacturers, food processors and affiliate members, informs nutrition and health professionals, government officials and consumers about the benefits of canned food, including its nutritional value, convenience, affordability, versatility, year-round availability, economic impact and sustainability.

As a National Strategic Partner of the U.S. Department of Agriculture (USDA) Center for Nutrition Policy and Promotion, the CFA conveys how canned foods can help fill MyPlate, the USDA nutrition guide. CFA's strategic partnerships with the Produce for Better Health Foundation, the National Fruit and Vegetable Alliance and the American Fruit and Vegetable Processors and Growers Coalition promote the consumption of all forms of fruits and vegetables, whether they are canned, fresh, frozen or dried. CFA works closely with additional organizations that share similar food and nutrition interests to address misconceptions regarding canned food, communicate the attributes of canned food with influencers such as registered dietitians and ensure fair legislative and regulatory language for canned foods in the government. For more information and a full list of CFA's partners, visit **www.mealtime.org.**

1 Freedman MR, Fulgoni V. Canned Vegetable and Fruit Consumption Is Associated with Changes in Nutrient Intake and Higher Diet Quality in Children and Adults: National Health and Nutrition Examination Survey 2001–2010. JAND 2015.

2 Kapica C, Weiss W (2012) "Canned Fruits, Vegetables, Beans and Fish Provide Nutrients at a Lower Cost Compared to Fresh, Frozen or Dried." *J Nutr Food Sci* 2:131. doi:10.4172/2155-9600.1000131.

The USS New York, pictured here, contains 24 tons of steel reclaimed and recycled from the World Trade Center.

Photo by Josh Haner/The New York Times/Redux

National Security and Infrastructure

It is vital to U.S. national economic security and to our homeland security that America does not become dangerously dependent on offshore sources of supply. Steel is a strategic material and its importance to the military must also be looked at in a broader context to include all of the steel that goes into the rails, rail cars, ground vehicles, tanks, ships, military barracks, fences and bases, at home and overseas. Steel is needed to harden existing U.S. infrastructure and installations so that a strong, domestic industry can provide immediate steel deliveries when and where required. Some examples of applications for domestic steel vital to America's infrastructure are:

- **Energy infrastructure** such as petroleum refineries, oil and gas pipelines, storage tanks, electricity power generating plants, electric power transmission towers and utility distribution poles.
- **Transportation infrastructure** such as highways, bridges, railroads, mass transit systems, airports, seaports and navigation systems.
- **Health and public safety infrastructure** such as dams and reservoirs, waste and sewage treatment facilities, the public water supply system and increasingly, residential construction.
- **Commercial, industrial and institutional complexes** such as manufacturing plants, schools, commercial buildings, chemical processing plants, hospitals, retail stores, hotels, houses of worship and government buildings.

American-made steels and specialty metals are crucial components of U.S. military strength.

The mine-resistant ambush-protected vehicles (MRAPs) played an essential role in properly equipping and protecting U.S. troops in parts of the world and utilize special armored steels that are produced and developed in America.

Photo: Stocktrek Images, Inc.

Military uses for steel are extensive. Thousands of skilled men and women of the American steel industry work to produce high-quality, cost-competitive products that the military uses in various applications ranging from aircraft carriers and nuclear submarines to Patriot and Stinger missiles, armor plate for tanks and field artillery pieces, as well as every major military aircraft in production today. Some examples of steel use in defense applications are:

- **The USS New York** was built with 24 tons of steel reclaimed and recycled from the World Trade Center.
- **The USS George H.W. Bush,** an aircraft carrier named after the 41st President, contains 47,000 tons of structural steel and serves as home to 6,000 Navy personnel.
- **Steel is a strategic material** needed to strengthen existing U.S. infrastructure and installations.

All segments of the domestic steel industry contribute directly or indirectly to the defense industrial base. Whether it is missiles, jet aircraft, submarines, helicopters, Humvees® or munitions, American-made steels and specialty metals are crucial components of U.S. military strength. Steel plate is used in the bodies and propulsion systems of the naval fleet. The control cables on virtually all military aircraft, including fighter jets and military transport planes, are produced from steel wire rope. In addition, land-based vehicles such as the Bradley Fighting Vehicle, Abrams Tank and MRAP vehicles use significant amounts of steel.

Image courtesy of EVRAZ North America

Transformational Technologies

The steel industry has been conducting research aimed at developing both incrementally improved and revolutionary iron and steelmaking technologies that will significantly reduce energy and greenhouse gas emissions. Two of these technologies rapidly progressing towards scale-up are highlighted below.

Novel Flash Ironmaking

An innovative ironmaking technology based on the direct gaseous reduction of fine iron oxide concentrates in a flash reduction process is under development at the University of Utah. The novel Flash Ironmaking Process takes advantage of shale gas discoveries in the United States and the productive use of the available large quantities of fine iron oxide concentrates.

Once fully implemented, the projected benefits of this novel technology include a reduction in energy consumption by using concentrates that do not require pelletization or sintering—potentially eliminating the use of coke. Significant environmental emission reductions—especially CO_2 emissions in comparison to the conventional blast furnace ironmaking route—come from using natural gas or hydrogen instead of coke as the reducing agent.

The novel Flash Ironmaking technology is to be applied to the production of iron as a feed to the steelmaking process initially, but could also be a part of a continuous direct steelmaking process eventually replacing the blast furnace and other alternative ironmaking processes.

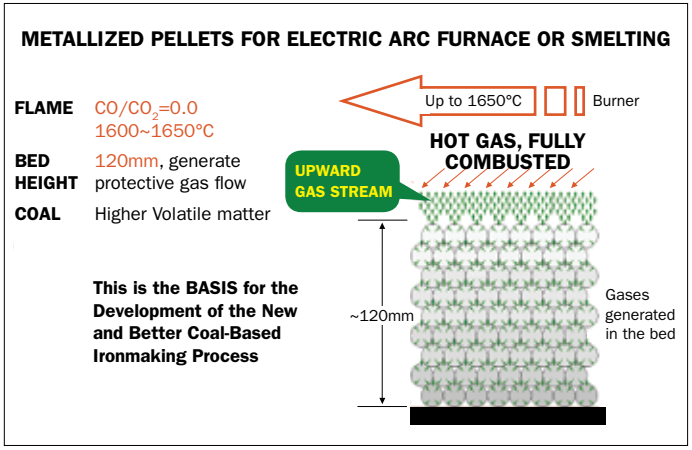
The reactor shown in Figure One was commissioned in late 2015. A comprehensive testing program will now be conducted by the University of Utah to identify technical and scale-up hurdles that will generate information on optimum operating temperature, gas velocity, reactor dimensions and refractory type needed to develop the design and construction of an industrial pilot-plant.

Image courtesy of Berry Metal Company

Figure One: Preliminary large-scale bench reactor facility layout

The Large Scale Bench Reactor after completion of construction, November 2015, and ready for experimental operation

Figure Two: Basis for paired straight hearth furnace development



Paired Straight Hearth Furnace

AISI members are also developing the paired straight hearth furnace (PSH), a high-productivity, low-energy ironmaking unit that can process steel plant wastes as well as virgin iron materials. The basis for the development of this new ironmaking process is that it potentially operates at higher production rates and lower energy utilization than conventional rotary hearth processes. The key is the tall bed design (120mm), which protects the bed from reoxidization and allows more complete combustion (*Figure Two*).

A series of large-scale laboratory furnace pelletization and revert material tests were conducted to determine the most appropriate furnace discharge method, calculate the level of furnace emissions and finalize the cost estimate for construction of a 50,000 tons per year demonstration plant. Complementary laboratory tests on a linear hearth furnace simulated the PSH process on a moving bed allowing for precise manipulation of key variables under controlled experimental conditions to accelerate scale-up. This transformational process is anticipated to be available for commercial demonstration within the next three years.

These research projects show the U.S. steel industry's commitment to developing technical solutions today that will help realize the next-generation steel plant of the future.

The American Iron and Steel Institute

Founded in 1855 as the American Iron Association, the American Iron and Steel Institute (AISI) has represented the steel industry for more than 150 years. Headquartered in Washington, D.C., AISI advocates on behalf of its member companies for public policies that support a globally competitive North American steel industry. Never has it been more critical than it is today for the industry to speak out loud and clear and with a unified voice on major policy issues that are impacting American manufacturers.

AISI's mission is to influence public policy, educate and shape public opinion in support of a strong, sustainable North American steel industry committed to manufacturing products that meet society's needs.

To achieve its mission, AISI:

- **FOCUSES ON THE ADVOCACY** of public policy issues central to the steel industry, issues where AISI can make an impact and issues where there is strong member alignment.
- **INFORMS AND EDUCATES** opinion leaders about the North American steel industry's strategic importance to national and economic security.
- **COMMUNICATES THE BENEFITS** that the industry's technological advances are making to the health and safety of its workforce and to the environment.
- **COLLECTS AND PROVIDES INDUSTRY DATA** to policymakers, company personnel and the public regarding steel operations, production, energy efficiency, shipments, import/export levels and consumption.
- **PURSUES TECHNOLOGY ADVANCEMENTS** through collaborative research and development.
- **ASSISTS MEMBER COMPANIES** in attracting and retaining talent.
- **ADVANCES THE COMPETITIVE USE** of steel in traditional and growth markets.

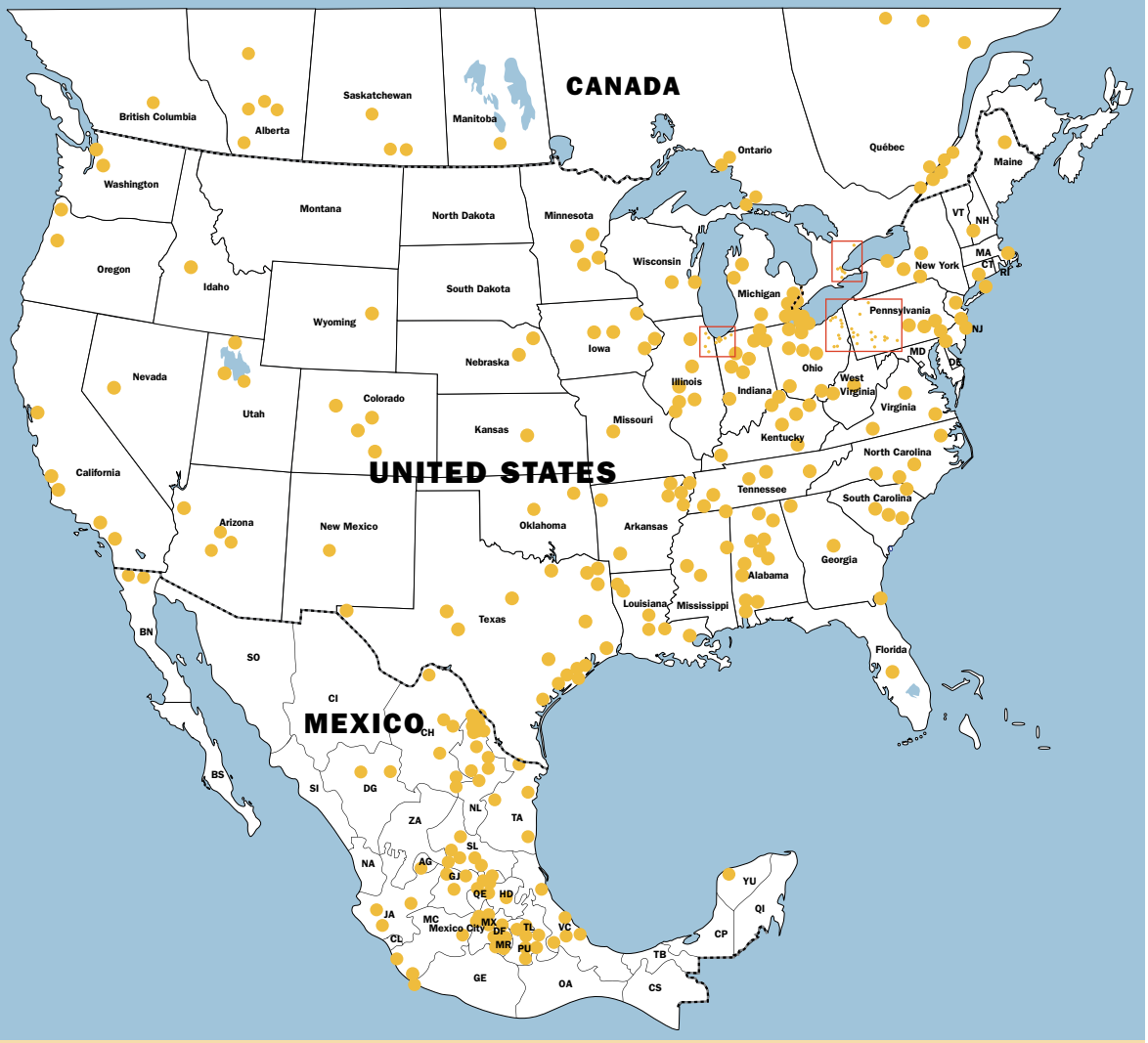
The Steel Market Development Institute

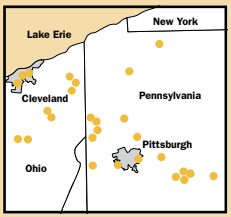
The Steel Market Development Institute (SMDI), a business unit of AISI, increases and defends the use of steel by developing and communicating innovative materials and designs. SMDI works to differentiate steel based on its environmental performance and demonstrate steel as the highest value material in the automotive, construction and packaging markets.

In partnership with its investor steel companies, SMDI:

- **WORKS WITH OUR AUTOMOTIVE CUSTOMERS** to advance and demonstrate steel's superior performance providing better value than competing materials.
- **PROVIDES STEEL-BASED SOLUTIONS** in the commercial and residential construction sectors, and transportation and infrastructure sectors, through applied research and technology transfer with its many partners in the construction markets, including using the codes and standards processes for market advantage.
- **INTERFACES WITH LEGISLATORS** and health professionals to ensure a level playing field for canned food in federal programs, and to inform these influential groups about canned food's high nutritional value to both children and adults.
- **LEVERAGES THE CAPABILITIES OF THE STEEL RECYCLING INSTITTUE (SRI)** in promoting recycling, sustainability and life cycle advantages of North American steel.

Steel Presence in North America





Map courtesy of Aim Market Research

AISI Producer Members and Their Locations in North America

AK STEEL CORPORATION

North American Locations
Headquarters: West Chester, OH

UNITED STATES

Indiana
Columbus: Tubular steel
Rockport: Continuous carbon/stainless pickling line, continuous carbon/stainless cold mill, stainless continuous annealing/pickling line, hydrogen annealing, temper mill, off-line coil inspection and continuous hot-dip galvanizing/galvannealing line

Kentucky
Ashland: Galvanized strip, galvannealed strip

Michigan
Dearborn: Continuous pickled cold rolling line, hot dipped galvanized and annealed sheet
Monroe: JV Spartan Steel Coating LLC (hot dipped galvanized sheet)

Ohio
Coshocton: Stainless steels in cold rolled strip, sheet coils
Mansfield: Flat-rolled carbon, silicon, ferritic stainless
Middletown: Enameling iron, electrogalvanized hot-dip galvanized, hot-dip aluminized, hot-dip aluminized stainless
Walbridge: Tubular steel
Zanesville: Oriented and non-oriented, electrical steel, stainless flat-rolled

Pennsylvania
Butler: Hot rolled, cold rolled, stainless, oriented and non-oriented electrical flat-rolled
Somerset County: AK Coal Resources, Inc. (a wholly-owned subsidiary of AK Steel)—metallurgical coal reserves

West Virginia
Follansbee: Mountain State Carbon, LLC (cokemaking)

North American Production: 7.5 million tons

ALTOS HORNOS DE MÉXICO, S.A.B. DE C.V.

North American Locations
Headquarters: Av. Juarez S/No., Col. La Loma, Monclova, Coahuila, México

MEXICO

Coahuila
Monclova facility: Plate, hot rolled coil, cold rolled coil, tin, tin free steel, structural shapes, service center

Distrito Federal
Mexico City: Sales office

Estado de Mexico
Atizapán de Zaragoza: Service center

Jalisco
Zapopan: Service center and sales office

Nuevo León
Monterrey: Nacional de Aceros, S.A. de C.V. (NASA): Light weight wall tubes, sales office

San Luis Potosí
San Luis Potosí: Sales office

UNITED STATES

Texas
San Antonio: Sales office

North American Production: 5.5 million tons

ARCELORMITTAL NORTH AMERICA

North American Locations
Headquarters: Chicago, IL

UNITED STATES

Alabama
Calvert: AM/NS Calvert (JV with Nippon Steel & Sumitomo Metal Corp.)

Illinois
Riverdale: Flat

Indiana
Burns Harbor: Flat and plate
East Chicago: Indiana Harbor (East and West): Flat, long (idled) and global research and development center
Gary: Plate
New Carlisle: I/N Tek and I/N Kote: Flat (JV with Nippon Steel & Sumitomo Metal Corporation)

Louisiana
LaPlace: Long products

Minnesota
Hibbing Taconite: Mine (JV with U. S. Steel and Cliffs Natural Resources)
Virginia: Minorca Mine

Mississippi
Jackson: Double G Coatings: Flat (JV with U. S. Steel)

North Carolina
Piedmont: Plate

Ohio
Cleveland: Flat
Columbus: Flat
Marion: Tube
Pioneer: Tailored blanks
Shelby: Tube
Warren: Coke

Pennsylvania
Coatesville: Plate
Conshohocken: Plate
Monessen: Coke
Steelton: Long

Tennessee
Harriman: Long
Murfreesboro: Tailored blanks

Texas
Vinton: Long

West Virginia
Princeton: Mine
Weirton: Flat

CANADA

Nunavut
Baffinland Iron Mines Corporation: JV Nunavut Iron Ore Holdings LP (Head office: Oakville, ON)

Ontario
Baycoat: JV U. S. Steel Canada (flat)
Brampton: Tube
Concord: Tailored blanks
Cote du Lac: Flat
Hamilton (Dofasco): Flat, long, tube and global research and development center
London: Tube
Windsor: JV DJ Galvanizing (flat)
Windsor: Flat
Woodstock: Tube

Quebec
Fire Lake: Mine
Longueuil: Long
Contrecoeur East: Long
Contrecoeur West: Long
Mount-Wright: Mine
Port-Cartier: Pellet plant and port
St. Patrick: Long

MEXICO

Guanajuato
Celaya: Long
Silao: JV Summit Plastics (tailored blanks)

Michoacan
Las Truchas: Mines
Lazaro Cardenas: Flat and long

Nuevo León
Monterrey: Tube

San Luis Potosí
San Lui Potosí–Villa de Reyes: Tailored blanks

Sonora (Idled)
Sonora–Ciudad Obregón: Mine
Sonora–Ejido en Rosario Tesopaco: Mine
Sonora–Guaymas: Port operation

North American Production: 25 million tonnes
North American Iron Ore Production: 41.7 million tonnes

CALIFORNIA STEEL INDUSTRIES

North American Locations
Headquarters: Fontana, CA

UNITED STATES

California
Fontana: Converts purchased steel slab into hot rolled, pickled and oiled, galvanized, and cold rolled sheet; electrical resistance welded pipe

North American Production: 2 million tons

CLIFFS NATURAL RESOURCES

North American Locations
Headquarters: Cleveland, OH

UNITED STATES

Michigan
Ishpeming: Tilden Mine
Palmer: Empire Mine

Minnesota
Babbitt: Northshore Mining Company (mine)
Eveleth: United Taconite (mine)
Forbes: United Taconite (processing facility)
Hibbing: Hibbing Taconite
Silver Bay: Northshore Mining Company (processing facility)

Cliffs Natural Resources Inc. is a leading mining and natural resources company in the United States. The Company is a major supplier of iron ore pellets to the North American steel industry from its mines and pellet plants located in Michigan and Minnesota. Cliffs also operates an iron ore mining complex in Western Australia.

U.S. Iron Ore Production: 19.3 million long tons in 2015

DEACERO, S.A.P.I. DE C.V.

North American Locations
Headquarters: San Pedro Garza Garcia, Nuevo León–Mexico

MEXICO

Baja California
Ensenada: Scrap recollection center
Mexicali: Wire products, scrap recollection center
Tijuana: Distribution center, scrap recollection center

Chiapas
Tapachula: Distribution center

Chihuahua
Chihuahua: Distribution center

Ciudad de Mexico
Delegacion Gustavo A. Madero: Scrap recollection center

Coahuila
Ramos Arizpe/Saltillo: Steelmaking, billet, wire rod, rebar, merchant bars, shapes, beams, wire products, scrap recollection center

Estado de Mexico
Tepeyac: Scrap recollection center
Tlalneplanta: Wire products, scrap recollection center, sales office
Tultitlan: Scrap recollection center

Guanajuato
León: Wire products
Villagran/Celaya: Steelmaking, billet, wire rod, rebar, merchant bars, wire products

Jalisco
Guadalajara: Scrap recollection center, distribution center, sales office

Michoacan
Morelia: Wire products

Morelos
Cuernavaca: Scrap recollection center

Nuevo León
Guadalupe: Wire products, scrap recollection center
Monterrey: Sales office
San Nicolas de los Garza: Scrap recollection center

San Pedro Garza Garcia: Main office
Santa Catarina: Wire products

Puebla
Puebla: Wire products, scrap recollection center, sales office

Queretaro
Queretaro: Wire products

San Luis Potosí
San Luis Potosí: Scrap recollection center

Sinaloa
Culiacan: Distribution center

Sonora
Hermosillo: Scrap recollection center

Tabasco
Chontalpa: Distribution center
Villahermosa: Distribution center

Tamaulipas
Matamoros: Scrap recollection center

Veracruz
Veracruz: Distribution center

Yucatan
Merida: Scrap recollection center, distribution center

UNITED STATES
Arizona
Phoenix: Sales office

Illinois
Chicago: Warehouse

Missouri
Poplar Bluff: Wire products

Texas
Corpus Christi: Scrap recollection center
Houston: Deacero USA, Inc. (wire products and sales office)
Laredo: Distribution center and warehouses

North American Production: 3.5 million tons

DTE ENERGY SERVICES

North American Locations
Headquarters: Ann Arbor, MI

UNITED STATES
Indiana
Burns Harbor

Michigan
River Rouge

Pennsylvania
Pittsburgh

North American Production: Among the many energy operations of DTE are steel mill coke and coal operations and cogeneration projects.

EVRAZ NORTH AMERICA

North American Locations
Headquarters: Chicago, IL

UNITED STATES
Colorado
Pueblo: Steelmaking, premium head hardened and standard rail, seamless OCTG, wire rod, coiled reinforcing bar, product technology center, sales office

Oregon
Portland: Plate, heat-treated plate, coil, large diameter spiral line pipe, technology lab, sales office

CANADA
Alberta
Calgary: ERW, OCTG casing and tubing with upsetting, threading and heat-treating capabilities, semi-premium connections, sales office

Camrose: Small and large diameter DSAW line pipe, ERW OCTG casing

Red Deer: ERW OCTG casing, small diameter line pipe with API, premium threading, permium connections

Saskatchewan
Regina: Steelmaking, plate and coil, ERW OCTG tubing, small and large diameter line pipe (ERW and spiral), research and development center, sales office

North American Production: EVRAZ North America is a leading North American producer of engineered steel products for rail, energy and industrial end markets. The company also operates numerous recycling businesses across the western U.S. and Canada.

HARSCO METALS & MINERALS

North American Locations
Headquarters: Seven Fields, PA

UNITED STATES

Alabama
Satsuma

Arkansas
Blytheville
Newport

Colorado
Pueblo

Florida
Tampa

Illinois
Pawnee
Pekin

Indiana
East Chicago
Gary
Pittsboro

Iowa
Muscatine

Kansas
LaCygne

Kentucky
Drakesboro

Missouri
Clifton Hill
Marston

North Carolina
Cofield

Ohio
Cheshire
Warren
Waterford

Pennsylvania
Braddock
Butler
Fairless Hills
Koppel
Latrobe
Midland
Natrona Heights
Orwigsburg
Sarver
Steelton

Tennessee
Memphis

Texas
Houston
Midlothian

Utah
Provo

West Virginia
Moundsville

CANADA

Ontario
Cambridge
Hamilton
Nanticoke
Whitby

Quebec
Contrecoeur
Sorel-Tracy

MEXICO

Coahuila
Saltillo

Guanajuanto
Celaya

Michoacan
Lazaro Cardenas

Nuevo León
Apodaca
Monterrey
San Nicolas

North American Production: Harsco provides innovative resource recovery technologies, environmental solutions and logistics services to the metals and minerals industries.

IVACO ROLLING MILLS 2004 L.P.

North American Locations
Headquarters: l'Orignal, Ontario, Canada

Ontario
l'Orignal: Hot rolled steel wire rod, billet

North American Production: 900,000 tons

NUCOR CORPORATION

North American Locations
Headquarters: Charlotte, NC

UNITED STATES

Alabama
Birmingham: Nucor Steel Birmingham (carbon steel reinforcing bar, rounds, squares)
Birmingham: Skyline Steel (sales)
Eufaula: American Buildings Company South Region (metal building systems)
Fort Payne: Vulcraft Alabama (carbon steel in joists, joist girders, composite floor joist, and floor and roof deck)
Riverside: Harris Rebar (rebar)
Trinity: Nucor Steel Decatur (carbon steel sheet in hot rolled, pickled, cold rolled, galvanized, galvannealed)
Tuscaloosa: Nucor Steel Tuscaloosa (carbon and high-strength alloy, hot rolled coil and cut-to-length plate for structural and pressure vessel applications)

Arizona
Kingman: Nucor Steel Kingman (carbon steel reinforcing bar, wire rod)
Phoenix: Harris Rebar (rebar)
Phoenix: Verco Decking (steel floor, roof deck)
Tucson: Harris Rebar (rebar)

Arkansas
Armorel: Nucor–Yamato Steel (carbon steel wide-flange beams, sheet and H-piling, miscellaneous and standard channels, angles, CZ and CSC car building sections, rail ties)
Armorel: Skyline Steel (coating and fabrication)
Blytheville: Nucor Steel Arkansas (carbon steel sheet in hot rolled, cold rolled, pickled, floor plate, galvanized coils)

California
Antioch: Verco Decking (steel floor, roof deck)
Fontana: Verco Decking (steel floor, roof deck)
Fresno: Harris Rebar (rebar)
Lakeside: Harris Rebar (rebar)
Lathrop: CBC Steel Buildings (metal building systems)
Livermore: Harris Rebar (rebar)
Pomona: Harris Rebar (rebar)
Sacramento: Skyline Steel (sales)

Colorado
Commerce City: Harris Rebar (rebar)
Denver: Skyline Steel (sales)

Connecticut
South Windsor: Harris Rebar (rebar)
Wallingford: Nucor Steel Connecticut (carbon steel reinforcing bar, wire rod, wire mesh fabrication, structural mesh fabrication, rolled wire, deformed wire)

Florida
Milton: Harris Rebar (rebar)
Orlando: Skyline Steel (sales)
Zellwood: Harris Rebar (rebar)

Georgia
Cartersville: Skyline Steel (threaded bar)
Duluth: Skyline Steel (sales)

Hawaii
Kapolei: Harris Rebar (rebar)

Idaho
Meridian: Harris Rebar (rebar)

Illinois
Belvidere: Harris Rebar (rebar)
Bourbonnais: Harris Rebar (rebar)
Bourbonnais: Nucor Steel Kankakee (carbon steel angles, rounds, flats, reinforcing bar)
Burr Ridge: Harris Rebar (sales)
El Paso: American Buildings Company Midwest Region (metal building systems)
Litchfield: Fisher & Ludlow (bar and safety grating, expanded metals products)
Newton: Skyline Steel (rolled and welded pipe)
Tinley Park: Skyline Steel (sales)

Indiana
Auburn: Harris Rebar (administration)
Crawfordsville: Nucor Steel Indiana (carbon steel sheet in hot rolled, cold rolled, pickled, floor plate and galvanized coils; stainless steel in hot rolled, cold rolled, pickled coils)
Mooresville: Harris Rebar (rebar)

St. Joe: Nucor Fastener Indiana (carbon and alloy steel standard hex head cap screws, hex flange bolts, structural bolts and nuts, finished hex nuts)
St. Joe: Vulcraft Indiana (carbon steel in joist, joist girders, composite floor joist, and floor and roof deck)
Waterloo: Nucor Building Systems Indiana (metal building systems)

Iowa
Newton: Harris Rebar (rebar)
Sioux City: Harris Rebar (sales)

Kentucky
Florence: Fisher & Ludlow (bar and safety grating, expanded metals products)
Ghent: Nucor Steel Gallation (hot rolled coils, hot rolled bands, hot rolled pickled and oiled, hot rolled slit coils)
Louisville: Harris Rebar (sales)

Louisiana
Convent: Nucor Steel Louisiana (direct reduced iron)
Mandeville: Skyline Steel (sales)
Slidell: Harris Rebar (sales)

Maryland
Baltimore: Harris Rebar (rebar)

Massachusetts
Deerfield: Harris Rebar (rebar)
Milford: Harris Rebar (administration)
Taunton: Skyline Steel (sales)

Michigan
Comstock Park: Harris Rebar (rebar)
Lansing: Harris Rebar (rebar)

Minnesota
Minneapolis: Harris Rebar (rebar)

Mississippi
Flowood: Harris Rebar (rebar)
Flowood: Nucor Steel Jackson (carbon steel angles, flats, reinforcing rounds, squares)
Iuka: Skyline Steel (spiralweld pipe)
Madison: Fisher & Ludlow (bar and safety grating, expanded metals products)
Starkville: Gulf States Manufacturing (metal building systems)

Missouri
Earth City: Skyline Steel (sales)
Kansas City: Harris Rebar (rebar)
Maryville: Nucor LMP Steel (cold finished bar and wire)
St. Louis: Harris Rebar (rebar)

Nebraska
Bellevue: Harris Rebar (rebar)
Norfolk: Nucor Cold Finish Nebraska (carbon, leaded and alloy cold drawn steel bar)
Norfolk: Nucor Steel Nebraska (carbon and alloy steel in special bar quality, cold heating quality and bearing quality, merchant bar quality in angles, channels, flats, hexagons, rounds and squares, rod, bar, squares, hex in coil)
Norfolk: Vulcraft Nebraska (carbon steel in joists, joist girders, composite floor joists, floor and roof deck)

Nevada
Carson City: American Buildings Company West Region (metal building systems)
Carson City: Harris Rebar (rebar)
Las Vegas: Harris Rebar (rebar)

New Hampshire
Canaan: Harris Rebar (rebar)

New Jersey
Avenel: Harris Rebar (rebar)
Middletown: Skyline Steel (sales)
Parsippany: Skyline Steel (corporate headquarters)

New Mexico
Albuquerque: Harris Rebar (rebar)

New York
Albany: Harris Rebar (rebar)
Auburn: Nucor Steel Auburn (carbon steel angles, channels, flats, reinforcing bars, rounds, squares)
Chemung: Vulcraft of New York (carbon steel in joists, joist girders, composite floor joists, special profile steel trusses, floor and roof deck)

North Carolina
Benson: Harris Rebar (sales)
Charlotte: Fisher & Ludlow (bar and safety grating, expanded metals products)
Cofield: Nucor Steel Hertford County (carbon steel plate)
Creedmoor: Harris Rebar (rebar)
Lumberton: Harris Rebar (rebar)

Ohio
Belpre: Skyline Steel (CF steel sheet pile)
Marion: Harris Rebar (rebar)
Marion: Nucor Steel Marion (carbon steel angles, flats, rebar, rounds, signposts)
Monroe: Harris Rebar (sales)
West Chester: Skyline Steel (sales)

Oregon
Portland: Harris Rebar (rebar)

Pennsylvania
Bethlehem: Harris Rebar (rebar)
Camp Hill: Skyline Steel (spiralweld pipe, threaded bar, micropile, accessories)
McKees Rocks: Fisher & Ludlow (bar and safety grating, expanded metals products)
Pittsburgh: Skyline Steel (sales)
Saegertown: Fisher & Ludlow (bar and safety grating, expanded metals products)
Wexford: Fisher & Ludlow (bar, safety grating, expanded metals products)

Rhode Island
Pawtucket: Harris Rebar (rebar)

South Carolina
Catawba: Harris Rebar (rebar)
Darlington: Nucor Cold Finish South Carolina (carbon leaded and alloy cold drawn steel bars)
Darlington: Nucor Steel South Carolina (carbon steel in special bar quality, merchant bar quality, and reinforcing products in the following shapes: angles, channels, flats, hexagons, reinforcing bars and rounds)
Florence: Vulcraft South Carolina (carbon steel in joists, joist girders, composite floor joists, and floor and roof deck)
Huger: Nucor Steel Berkeley (carbon steel sheet in hot rolled, cold rolled, pickled, galvanized, and galvannealed coils, carbon steel wide range beams, manufacturing housing beams, standard I beams, and miscellaneous and standard channels)
Swansea: Nucor Building Systems South Carolina (metal building systems)

Tennessee
Collierville: Harris Rebar (sales)
Memphis: Nucor Steel Memphis (carbon steel in special bar quality rounds, round cornered squares)
Portland: Kirby Building Systems (metal building systems)

Texas
Dallas: Harris Rebar (rebar)
Dayton: Harris Rebar (rebar)
Grapeland: Vulcraft Texas (carbon steel in joists, joist girders, composite floor joists, special profile steel trusses, floor and roof deck)
Houston: Skyline Steel (sales)
Jewett: Nucor Steel Texas (carbon steel angles, channels, flats, reinforcing bars, rounds, special sections, squares, U.M. plates)
Longview: Harris Rebar (rebar)
New Braunfels: Harris Rebar (rebar)
Terrell: Nucor Building Systems (metal building systems)

Utah
Brigham City: Nucor Building Systems (metal building systems)
Brigham City: Nucor Cold Finish Utah (cold finished SBQ bar products, cold rolled wire, welded wire mesh)
Brigham City: Nucor Wire Products Utah (carbon steel standard mesh, mine mesh, rolled wire)
Brigham City: Vulcraft Utah (carbon steel in joists, joist girders, composite floor joists, special profile steel trusses)
Plymouth: Nucor Steel Utah (carbon steel angles, channels, flats, reinforcing bars, rounds, squares)
Salt Lake City: Harris Rebar (rebar)

Virginia
Fredericksburg: Harris Rebar (rebar)

LaCrosse: American Buildings Company Atlantic Region (metal building system)
Springfield: Skyline Steel (sales)

Washington
Auburn: Harris Rebar (rebar)
Burbank: Harris Rebar (rebar)
Fife: Skyline Steel (sales)
Lake Stevens: Harris Rebar (rebar)
Longview: Skyline Steel (rolled and welded pipe, spiralweld pipe)
Seattle: Nucor Steel Seattle (carbon steel angles, channels, flats, reinforcing bar, rounds, squares)
Tacoma: Harris Rebar (rebar)

Wisconsin
Appleton: Harris Rebar (sales)
Menomomie: Harris Rebar (rebar)
Oak Creek: Nucor Cold Finish Wisconsin (carbon, leaded, alloy cold drawn steel bars)
Waukesha: Harris Rebar (rebar)

CANADA
Alberta
Calgary: Harris Rebar (rebar)
Edmonton: Fisher & Ludlow (bar and safety grating, expanded metals products)
Fort Saskatchewan: Harris Rebar (rebar)
Leduc: Harris Rebar (rebar)
St. Albert: Sklyine Steel(sales)
Wetaskiwin: Fisher & Ludlow (bar and safety grating, expanded metals products)

British Columbia
Abbotsford: Harris Rebar (rebar)
Delta: Harris Rebar (sales)
Kelowna: Harris Rebar (rebar)
Nanaimo: Harris Rebar (rebar)
Prince George: Harris Rebar (rebar)
Richmond: Harris Rebar (rebar)
Surrey: Fisher & Ludlow (bar and safety grating, expanded metals products)

Manitoba
Winnipeg: Harris Rebar (rebar)

New Brunswick
St. John: Harris Rebar (rebar)

Newfoundland
Conception Bay: Harris Rebar (rebar)

Nova Scotia
Dartmouth: Harris Rebar (rebar)

Ontario
Belleville: Skyline Steel (sales)
Brampton: Harris Rebar, (rebar)
Burlington: Fisher & Ludlow (bar and safety grating, expanded metals products)
Burlington: Laurel Steel (cold finish steel bar)
Lively: Harris Rebar (rebar)
London: Harris Rebar (rebar)
Maidstone: Harris Rebar (rebar)
Ottawa: Harris Rebar (rebar)
Sarnia: Harris Rebar (rebar)
Stoney Creek: Harris Rebar (rebar)
Stoney Creek: Harris Steel Group (corporate headquarters)
Thunder Bay: Harris Rebar (rebar)

Quebec
Point Aux Trembles: Fisher & Ludlow (bar and safety grating, expanded metals products)
St. Bruno: Skyline Steel (sales)
Saskatchewan
Regina: Harris Rebar (rebar)
Saskatoon: Harris Rebar (rebar)

North American Production: 28.8 million tons

The David J. Joseph Co. (A Nucor Subsidiary)
The David J. Joseph Co. is a scrap subsidiary of Nucor Corporation with numerous locations in the following states: Alabama, Arizona, Colorado, Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Missouri, Nebraska, Nevada, New Mexico, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, Utah, Washington and Wisconsin.

SSAB AMERICAS

North American Locations
Headquarters: Lisle, IL

UNITED STATES
Alabama
Mobile: Plate, quench and temper plate, normalized plate and coil

Iowa
Montpelier: Plate, slit coil and coil

Minnesota
Roseville: Cut-to-length sheet and plate

Texas
Houston: Cut-to-length sheet and plate

CANADA
Ontario
Scarborough: Temper leveled cut-to-length sheet and plate

North American Production: 2.5 million tons

TENARIS TAMSA

North American Locations
Headquarters: Mexico City, Mexico

MEXICO
Tabasco
Comalcalco: Threading facilities

Tenaris Tamsa
Veracruz: Seamless steel tubes, research and development center, threading facility

UNITED STATES
Arkansas
Blytheville: Maverick Tube Corporation (welded steel tubes)

California
Bakersfield: Hydril Company (threading facility)

Louisiana
Westwego: Hydril Company (threading facility)

Texas
Conroe: Maverick Tube Corporation (welded steel tubes)
Downhole Center/Houston: Tenaris Coiled Tubes, LLC (coiled tubes facility)
Houston: Texas Arai (couplings facility)
McCarty/Houston: Hydril Company (threading facility)
Subsea Center/Houston: Tenaris Coiled Tubes, LLC (coiled tubes facility)

CANADA
Ontario
Saulte Ste. Marie: Algomatubes Inc. (seamless steel tubes)

Alberta
Calgary: Prudential Steel Ltd. (welded steel tubes)
Nisku: Hydril Canadian Company Ltd. (threading facility)

North American Production: 1.2 million tons

TERNIUM

North American Locations
Headquarters Location: Monterrey, Mexico

MEXICO
Coahuila
Monclova: Galvanized and color coated steel sheets

Nuevo León
Apodaca: Rebars, roll-formed, billets
Ciénega de Flores: Metal building systems
Monterrey: HRC, CRC
Pesquerîa: CRC and galvanized coils, high-end steel products
San Nicolás de los Garza: HRC, CRC, profiles and tubes, panels, galvanized and color coated coils, roll-formed

Puebla
Puebla: Rebar, wire rod, round bar

Product Distribution Centers
Baja California
Tijuana

Chiapas
Túxtla Gutierrez

Chihuahua
Chihuahua

Distrito Federal
Ciudad de México

Jalisco
Guadalajara

Nuevo León
Monterrey

Puebla
Puebla

Querétaro
Querétaro

Sinaloa
Culiacán

Veracruz
Veracruz

Yucatán
Mérida

Product Service Centers
Nuevo Léon
Apodaca
Monterrey
San Nicholás de los Garza

San Luis Potosi
San Luis Potosi

Mines
Colima
Peña Colorada (Ternium share 50%)

Michoacán
Aquila

UNITED STATES
Louisiana
Shreveport: Galvanized, color coated sheets
North American Production: 7.2 million tons

TIMKENSTEEL CORPORATION

North American Locations
Headquarters: Canton, OH

UNITED STATES
North Carolina
Columbus: Tryon Peak steel plant (value-added processes)
Ohio
Akron: City Scrap and Salvage (scrap metal for steelmaking operations)
Canton: Faircrest Steel Plant (specialty alloy steel bars, billets)
Canton: Gambrinus Steel Plant (seamless mechanical tubing)
Canton: Harrison Steel Plant (specialty alloy steel bars)
Eaton: St. Clair Plant (specialty steel components)

Texas
Houston: Timken Boring Specialties (value-added processes)

North American Production: 1.3 million tons

UNITED STATES STEEL CORPORATION

North American Locations
Headquarters: Pittsburgh, PA

UNITED STATES
Alabama
Fairfield: Rounds, seamless tubular mill, sheet finishing

Arkansas
Pine Bluff: Tubular couplings

California
Pittsburg: JV USS-POSCO Industries (sheets and tin mill) and JV United Spiral Pipe, LLC (spiral welded tubular)

Illinois
Granite City: Sheets, slab

Indiana
East Chicago: Tin mill
Gary: Slabs, tin mill, sheets, strip mill plate
Portage: JV Chrome Deposit Corporation (processing, administrative)
Portage: Sheets and tin mill

Michigan
Canton: JV Worthington Specialty Processing (steel processing)
Dearborn: Great Lakes EGL at Dearborn
Ecorse and River Rouge: slabs and sheets
Ishpeming: Tilden Mining Company (iron ore pellets, ownership interest)
Jackson: JV Worthington Specialty Processing (steel processing)
Taylor: JV Worthington Specialty Processing (steel processing)
Troy: Research, development and sales center

Minnesota Mining Operations
Hibbing: Hibbing Taconite Company (iron ore pellets, ownership interest)
Keewatin: Keetac Iron Ore Operations (iron ore pellets)
Mt. Iron: Minnitac Iron Ore Operations (iron ore pellets)

Mississippi
Jackson: JV Double G Coatings Company, L.P. (galvanized and GALVALUME® sheets)

Ohio
Leipsic: JV PRO-TEC Coating Company (coat sheet and value add sheet)
Lorain: Seamless tubular

Pennsylvania
Braddock: Slabs
Clairton: Coke
Fairless Hills: Galvanized sheets
Munhall: Research and Technology Center
West Mifflin: Sheets

Texas
Houston: Tubular couplings, processing, threading, inspection and storage service, research and development center
Hughes Springs: Tubular couplings
Lone Star: Welded tubular
Midland: JV Patriot Premium Threading Services (tubular finishing)

CANADA

Alberta
Calgary: U. S. Steel Tubular Products Canada Sales Office

Ontario
Stoney Creek: JV D.C. Chrome Limited (processing and joint venture)

MEXICO

Coahuila
Ramos Arizpe: JV Acero Prime (processing, warehousing)

Mexico State
Toluca: JV Acero Prime (processing, warehousing)

San Luis Potosi
San Luis Potosi: JV Acero Prime (processing, warehousing)

North American Production: 22.0 million tons

USS-POSCO INDUSTRIES

North American Locations
Headquarters: Pittsburg, CA

California
Pittsburg: Sheet products and tin mill

North American Production: 900,000 tons

Steel Champion Award

In 2015, AISI launched the "Congressional Steel Champion Award" to show appreciation for those members of Congress who helped get trade remedy improvement provisions enacted. AISI Board members presented awards to (top L-R) Rep. Pat Tiberi (R-OH), Rep. Bradley Byrne (R-AL), Reps. Mike Bost (R-IL) and Rodney Davis (R-IL),Sen. Michael Bennet (D-CO), Sen. Sherrod Brown (D-OH), Rep. Tim Murphy (R-PA), Sen. Rob Portman (R-OH), Rep. Lou Barletta (R-PA), and Rep. Scott Tipton (R-CO).

AISI Producer Members

AHMSA
ALTOS HORNOS DE MEXICO

AK Steel

ArcelorMittal

CLIFFS

CSI
CALIFORNIA STEEL INDUSTRIES, INC.

DEACERO

DTE Energy
DTE Energy Resources, LLC

EVRAZ

HARSCO
METALS & MINERALS

IVACO ROLLING MILLS 2004 LP
A HEICO COMPANY

Ternium

NUCOR

SSAB

Tenaris

TIMKEN STEEL

USS POSCO

U. S. Steel

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